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Concluded*

~~a lens that optically couples an image displayed on the display to an eye of a user~~  
for viewing by the user; and

~~a battery carried by the housing for powering the central processing unit, the transceiver, the receiver, the display, the light source, and the display driver circuit.~~

### REMARKS

Claims 21-29, 31-48, 50-66, 68-85 are pending in the Application. All claims have been rejected under 35 U.S.C. § 103(a). In response, certain claims have been amended and others added to the application to more distinctly claim and clearly distinguish the invention from the cited references.

#### Regarding Rejections

Claims 21-29, 31-48, 50-66, and 68-85 have been rejected under 35 U.S.C. § 103(a) as being unpatentable under Schoolman (U.S. Patent 5,281,957) in view of Ohnsorge (U.S. Patent 5,485,504), Spitzer (WO 93/18428) and Nathanson (U.S. Patent 4,010,322). In response, certain claims have been amended or cancelled and new claims added to the application. As amended, independent claims 21, 40, 59 and 71 are not obvious in light of these references and reconsideration is respectfully requested.

#### The Cited References Do Not Teach All of the Claim Limitations

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.<sup>1</sup> “All words in a claim must be considered in judging the patentability of that claim against the prior art.”<sup>2</sup>

Schoolman discusses a portable computer and head mounted display. Schoolman’s FIG. 1 illustrates the portable computer with a head mounted display where the computer is self-contained and separate from the display (see Schoolman, col. 4, l. 68 - col. 5, l. 2). Furthermore,

<sup>1</sup> *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

<sup>2</sup> *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Schoolman discusses an external electronic module where "the head mounted display is plugged into [the] display electronics module" and where "the module 3 contains most of the display electronics needed to interface the display 2 with the computer 1." (Schoolman, col. 4, ll. 7-12). Schoolman's Fig. 10 illustrates the computer board or CPU (71) as being located within the module (3). Schoolman also discusses that the computer is housed in a keyboard housing. (Schoolman, col. 5, ll. 1-3).

The Examiner acknowledges that Schoolman fails to disclose "a wireless transceiver within the telephone housing for transmitting and receiving audio and a wireless receiver within the telephone housing that receives image." The Examiner further recognizes that Schoolman "also fails to disclose the liquid crystal display having an active matrix circuit including an array of transistors and an array of pixel electrodes such that the active matrix circuit is bonded to an optically transmissive substrate with an adhesive layer" and that Schoolman fails to disclose "a battery carried by the housing for powering the transceiver, the receiver, the display, the light source and the circuit." For those limitations, the Office Action cites Ohnsorge, Spitzer, and Nathanson.

The Examiner argues that Ohnsorge "teaches a telephone device which comprises a wireless transceiver with the telephone housing for transmitting and receiving audio and a wireless receiver within the telephone housing that receives image data." Ohnsorge discusses a hand-held radiotelephone having a microphone, loudspeaker and an electronic circuit mounted within a housing. The housing also includes a liquid crystal display video display device and a camera as a video pickup device. For ISDN communications, two B channels are used, one for audio transmissions and one for video transmissions.

The Examiner relies on Spitzer to "teach an active matrix display with red, green and blue backlight sources for a head-mounted display system." Spitzer discusses a head-mounted display system having a high resolution active matrix display such as "an active matrix single crystal silicon display device 2010 mounted in close proximity to [an] eye 2012." (Spitzer, p. 63, ll. 19-21). The head mounted display system includes a support frame for positioning or a user's head, an active matrix display mounted on the frame and a lens positioned between the display and a user's eye. The active matrix display of Spitzer includes a plurality of row address lines, a plurality of column address lines, an array of pixel circuits, and an array of pixel electrodes.

Each pixel circuit is formed in a thin film of single crystal material. Also, each pixel circuit is connected to one row address line and one column address line.

The Examiner also relies on Nathanson to "teach a portable telecommunications device which comprises a power supply (30) for powering the display, transceiver, receiver, light source and circuit within the housing." Nathanson discusses "a high resolution cathode ray tube." (Nathanson, col. 5, l. 30) and "a cathode ray tube driver means connected between the input signal receiver means and the cathode ray tube for establishing an electron charge pattern on the light valve target array corresponding to the communicated display image input signal." (Nathanson, col. 5, l. 38 - col. 6, l. 1).

Claims 21, 40, 59 and 71 have been amended to include a central processing unit mounted within the housing and coupled with the other components of the portable communications device. For example, the Applicants' amended claim 21 now recites a housing, a central processing unit mounted within the housing, a wireless transceiver within the housing and coupled to the central processing unit for transmitting and receiving audio, and a wireless receiver within the housing and coupled to the central processing unit for receiving image data. The Applicants' amended claims 40 and 71 now recite a housing, a central processing unit mounted within the housing and a wireless receiver coupled to the central processing unit that receives audio and image data.

With these amendments, all limitations of the Applicants' independent claims are neither taught nor suggested by the prior art. None of the prior art references cited by the Examiner include a central processing unit within the same housing as the electronic components of the device, such as a wireless receiver, a wireless transceiver, and a display driver circuit.

In particular, as disclosed above, Schoolman does not disclose or suggest the use of a central processing unit within a housing of a portable telecommunications device. By contrast, the Applicants claim a portable communications device including a housing, a central processing unit mounted within the housing and electronics, including a wireless transceiver and a wireless receiver mounted within the housing and coupled to the central processing unit.

Because neither Schoolman, Ohnsorge, Spitzer, nor Nathanson, either alone or in combination, teach all of the limitations of Applicants' independent claims, as amended, claims 21, 40, 59 and 71 are not obvious over the cited prior art and should be allowed to issue.

Furthermore, claims 22-29, 31-36, and 38-39, which depend upon claim 21, claims 41-48, 50-55, and 57-58, which depend upon claim 40, claims 61 and 63, which depend upon claim 59, and claims 72-82 and 84-85, which depend upon claim 71, should also be allowed to issue, at least, for the reasons presented.

The Cited References Do Not Combine to Form the Applicants' Device as Claimed

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention as a whole, absent some teaching, suggestion or incentive supporting the combination.<sup>3</sup> While a prior art device "may be capable of being modified to run the way [an] apparatus is claimed, there must be a suggestion or motivation in the reference to do so."<sup>4</sup>

In reviewing the references cited by the Examiner, the head mounted display of Schoolman could be combined with the display of Spitzer to form a high resolution, active matrix, head mounted display for use with a computer system. However, there is no suggestion to combine Schoolman, Spitzer, Ohnsorge, and Nathanson to form a portable communications device having a central processing or display driver circuitry unit mounted within the housing of the device, as claimed by the Applicants.

Schoolman discusses a head mounted display used with a portable computer where the computer is self-contained and separate from the display. Schoolman does not teach combining a head mounted display with a central processing unit in the display housing. Furthermore, because Schoolman is directed toward a head mounted display used with a computer system, which has its own CPU and display driver circuitry, there is no motivation to mount the central processing unit or display driver circuitry within the display housing. To utilize the display of Schoolman, a user connects the display to a video connector of an external computer, having a central processing unit. Therefore, the use of the head mounted display with a computer, on its face, suggests that the central processing unit and display driver circuitry are external to the head mounted display and provides no motivation to place the central processing unit and display

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<sup>3</sup> *In re Geiger*, 815 F.2d 686, 2 U.S.P.Q. 2d 1276 (Fed. Cir. 1987), *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988).

<sup>4</sup> *In re Mills*, 916 F.2d 680, 682, 16 U.S.P.Q. 2d 1430, 1432 (Fed. Cir. 1990).

driver circuitry within the housing. One of ordinary skill in the art having knowledge of Schoolman would only find motivation to make a head-mounted dumb display - not a head-mountable communication system.

Not only does Schoolman lack any motivation to combine the references, it actually teaches away from the claimed invention. Schoolman explicitly requires three components: (1) a computer to generate raster scan computer images, (2) a display electronics module having video monitor electronics to convert the raster images to a matrix format, and (3) a head-mountable display. The Applicants, in contrast, have no need for a raster-to-matrix conversion because the display driver circuitry can be optimized for the matrix display. The Applicants' integration of the CPU, display driver circuitry, and matrix display into a single portable unit is thus contrary to the teachings of Schoolman.

At best, the combined teachings of the cited references would produce a high-resolution, head mounted display having a microphone, a loudspeaker, and a battery to provide power during transportation of the device, where the device is connectable to a computer and display driver circuitry external to the head mounted display in order to drive the high resolution display. The cited teachings do not combine to produce a head mounted display having a central processing unit and display driver circuitry within the display housing.

Because there is at least no suggestion to utilize a central processing unit within the portable communications device in any of the references cited by the Examiner, there can be no suggestion to combine the references to form the communications device claimed by the Applicants. Claims 21, 40, 59 and 71 are therefore not obvious over the cited prior art and should be allowed to issue. Furthermore, claims 22-29, 31-36, and 38-39, which depend upon claim 21, claims 41-48, 50-55, and 57-58, which depend upon claim 40, claims 61 and 63, which depend upon claim 59, and claims 72-82 and 84-85, which depend upon claim 71, should also be allowed to issue, at least, for the reasons presented.

Regarding New Claims

Claims 86-107 have been added to the application. The subject matter of claims 86-97 are shown in Figures 35-45 and are described in the specification on page 34, line 19 through page 35 line 26. The subject matter of claims 98-100, display control circuitry, was originally included as part of independent claims 21, 40, and 71 but has been removed and rewritten in dependent form. The subject matter of claims 101-103 is supported on page 12, lines 8-11 of the specification. Claims 104-106 include material which has been deleted from claims 21, 40, and 71 and rewritten in dependent form. Claim 107 includes material from claim 21 and claims 86-89. New claims 86-107 do not add new matter to the Application.

CONCLUSION

In view of the above amendments and remarks, it is believed that claims 21-29, 31-36, 38-48, 50-55, 57-59, 61, 63, 71-82, 84-85 and 86-107 are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned attorney at (978) 341-0036.

Respectfully submitted,

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Dated: November 13, 2001

MARKED UP VERSION OF AMENDMENTSClaim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

21. (Thrice Amended) A portable communications device comprising:
- a [telephone] housing;
- a central processing unit mounted within the housing;
- a wireless transceiver within the [telephone] housing and coupled to the central processing unit for transmitting and receiving audio;
- a wireless receiver within the [telephone] housing and coupled to the central processing unit [that receives] for receiving image data;
- an active matrix liquid crystal display within the housing, the display having an active matrix circuit [including an array of transistor circuits and an array of pixel electrodes such that the active matrix circuit is bonded to an optically transmissive substrate with an adhesive layer];
- a light source in the housing that is optically coupled to the display, where light from the light source is directed onto the display;
- a display driver circuit [connected to the wireless receiver] within the housing and coupled to the central processing unit and the display, the display driver circuit forming images on the display for viewing by a user;
- a lens that [magnifies] optically couples an image displayed on the display to an eye of a user for viewing by [a] the user; and
- [a display control panel on the telephone housing; and]
- a battery carried by the [telephone] housing for powering the central processing unit, the transceiver, the receiver, the display, the light source, and the display driver circuit.
22. (Twice Amended) The device of Claim 21 wherein the active matrix liquid crystal display and the lens are positioned within a display module attached to the [telephone] housing.

23. (Twice Amended) The device of Claim 22 wherein the display module rotates relative to the [telephone] housing.
24. (Twice Amended) The device of Claim 21 wherein the [telephone] housing comprises a head mounted support.
29. (Amended) The device of Claim 21 further comprising a port coupled to the housing for receiving a memory card.
33. (Amended) The device of Claim 21 further comprising a modem within the [device] housing.
35. (Amended) The device of Claim [21] 22 wherein the display module comprises a reflector positioned around [the] a backlight.
38. (Amended) The device of Claim 22 further comprising a flexible ribbon cable connecting the [device] housing and the display module.
40. (Thrice Amended) A portable wireless telephone comprising:
  - a [telephone] housing;
  - a central processing unit mounted within the housing;
  - a wireless receiver within the housing [that receives] and coupled to the central processing unit for receiving audio and image data;
  - an active matrix liquid crystal display within the housing, the display having an active matrix circuit [including an array of transistor circuits and an array of pixel electrodes such that the active matrix circuit is bonded to an optically transmissive substrate with an adhesive layer];
  - a light source within the housing that is optically coupled to the display such that light from the light source is directed onto the display;

a display driver circuit [connected to the wireless receiver] within the housing and coupled to the central processing unit and the display, the display driver circuit forming images on the display for viewing by a user;

a lens that [magnifies] optically couples an image displayed on the display to an eye of a user for viewing by [a] the user; and

[a display control panel on the telephone housing; and]

a battery within the [telephone] housing for powering the central processing unit, the receiver, the display and the driver circuit.

41. (Twice Amended) The telephone [device] of Claim 40 wherein the active matrix liquid crystal display and the lens are positioned within a display module attached to the [telephone] housing.
42. (Twice Amended) The telephone [device] of Claim 41 wherein the display module rotates relative to the [telephone] housing.
43. (Amended) The telephone [device] of Claim 40 wherein the housing comprises a head mounted support.
44. (Amended) The telephone [device] of Claim 40 wherein the active matrix liquid crystal display comprises a video display.
45. (Amended) The telephone [device] of Claim 40 wherein the display has an array of at least 640 x 480 pixel electrodes.
46. (Amended) The telephone [device] of Claim 40 further comprising a cholesteric liquid crystal element along an optical path between the display and the lens.
47. (Amended) The telephone [device] of Claim 40 further comprising a video processing circuit within the housing.

48. (Amended) The telephone [device] of Claim 40 further comprising a port coupled to the housing for receiving a memory card.
50. (Amended) The telephone [device] of Claim 40 further comprising a backlight for the active matrix display.
51. (Amended) The telephone [device] of Claim 50 wherein the backlight comprises red, green and blue light sources.
52. (Twice Amended) The telephone [device] of Claim 40 further comprising a modem within the [device] housing.
53. (Amended) The telephone [device] of Claim 40 wherein the array of transistors is formed with a silicon-on-insulator (SOI) structure.
54. (Amended) The telephone [device] of Claim 41 wherein the display module comprises a reflector positioned around [the] a backlight.
55. (Amended) The telephone [device] of Claim 40 wherein the display has a diagonal length of 0.7 inches or less.
57. (Twice Amended) The telephone [device] of Claim 41 further comprising a flexible ribbon cable connecting the [telephone] housing and the display module.
58. (Amended) The telephone [device] of Claim 40 wherein the active matrix display and the lens are on a single optical axis.
59. (Thrice Amended) A method of [viewing an image with] operating a portable communications device comprising:

[providing a telephone housing enclosing a wireless image receiver, and a transceiver; providing an active matrix liquid crystal display, the display having an active matrix circuit including an array of transistor circuits formed with a single crystal silicon material and an array of pixel electrodes;]

powering a central processing unit, a wireless [the] receiver, a wireless [the] transceiver, and an active matrix liquid crystal [the] display disposed within a common housing by a battery in the [telephone] housing;

operating [a] display control [panel on the device] circuitry in the housing to display an image, the display control [panel] circuitry being connected to a display driver circuit [and the wireless receiver]; and

viewing through a lens [a magnified] an optically coupled image of the displayed image.

61. (Twice Amended) The method of Claim [60] 59 further comprising rotating [the] a display module containing the active matrix liquid crystal display and lens relative to the [telephone] housing of the portable communications device.
71. (Twice Amended) A portable wireless telephone comprising:
  - a [telephone] housing;
  - a central processing unit mounted within the housing;
  - a wireless receiver within the housing and coupled to the central processing unit that receives audio and image data;
  - an active matrix liquid crystal display within the housing and coupled to the central processing unit and mounted within a display module, the display having an active matrix circuit [including an array of transistor circuits formed with a single crystal silicon material and an array of pixel electrodes];
  - a display driver circuit [connected to the wireless receiver] within the housing and coupled to the central processing unit and the display, the display driver circuit forming images on the display for viewing by a user;

a lens mounted within the display module that [magnifies] optically couples an image displayed on the display to an eye of a user for viewing by [a] the user;

a light source mounted within the display module having red, green and blue elements and that directs red, green and blue light onto the display; and

[a display control panel on the telephone housing; and]

a battery within the [telephone] housing for powering the central processing unit, the receiver, the display, and the display driver circuit.

72. (Amended) The telephone [device] of Claim 71 wherein the display module rotates relative to the [telephone] housing.
73. (Amended) The telephone [device] of Claim 71 wherein the housing comprises a head mounted support.
74. (Amended) The telephone [device] of Claim 71 wherein the active matrix liquid crystal display comprises a video display.
75. (Amended) The telephone [device] of Claim 71 wherein the display has an array of at least 640 x 480 pixel electrodes.
76. (Amended) The telephone [device] of Claim 71 further comprising a cholesteric liquid crystal element along an optical path between the display and the lens.
77. (Amended) The telephone [device] of Claim 71 further comprising a video processing circuit within the housing.
78. (Amended) The telephone [device] of Claim 71 further comprising a port coupled to the housing that receives a memory card.

79. (Amended) The telephone [device] of Claim 71 further comprising a modem within the [telephone] housing.
80. (Amended) The telephone [device] of Claim 71 wherein the array of transistors is formed with a silicon-on-insulator (SOI) structure.
81. (Amended) The telephone [device] of Claim 71 wherein the display module comprises a reflector around the light source.
82. (Amended) The telephone [device] of Claim 71 wherein the display has a diagonal length of 0.7 inches or less.
84. (Amended) The telephone [device] of Claim 71 further comprising a flexible ribbon cable connecting the [telephone] housing and the display module.
85. (Amended) The telephone [device] of Claim 71 wherein the active matrix display and the lens are on a single optical axis.

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